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EXAMINER	
KASSA, HILINA S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/680,018	HALL ET AL.	
	Examiner	**Art Unit**	
	HILINA S. KASSA	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 13 June 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-16 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-16 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 06/13/2008, with respect to the rejection(s) of claim(s) 1-16 under Marshall et al. (US Publication Number 2004/0156079 A1) in view of Roylance (US Publication Number 2002/0067509 A1) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Gibson (US Patent Number 5,828,361).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6 and 10-15 are rejected under 35 U.S.C. 103(a) as being obvious over Gibson (US Patent Number 5,828,361) and Hattori (US Patent Number 6,369,911 B1) and further in view of Roylance (US Publication Number 2002/0067509 A1).

(1) regarding claim 1:

As shown in figure 4, Gibson discloses a host machine including (**401, figure 4**), comprising:

an application to generate page data at a predetermined bit rate per plane per pixel (**column 4, line 65-column 5, lines 2; note that a single bit per pixel raster data structure called plane which specifies the pixels of the multiple bit per pixel gets generated**),

an image processor (**402, figure 4**), based on image data contained in a pixel or a group of pixels in the page data (**column 5, line 64-column 6, line 2; note that the stored color image as multiple bit per pixel raster data gets encoded in a multiple bit color value**), to render interim data that contains a multi-bit value per plane per pixel (**column 6, lines 5-8; note that the image data has already been rasterized and is ready to be transferred to the outputting device**), and

an I/O device to communicate the interim data (**column 6, lines 31-34; note that the interim or each plane that has bit per pixel gets transmitted to the display device**); and

Gibson disclose all of the subject matter as described as above except for specifically teaching a printing system comprising: a printing device including, an I/O device to communicate the interim data, a pulse code generator, to receive the interim data, for each multi-bit value, and to generate a pulse code corresponding to the multi-bit value, and a print engine, to receive the pulse codes and to transform the pulse codes to a hardcopy image.

However, as shown in figure 1, Hattori discloses a printing system (**100, 200, figure 1**) comprising: a printing device including (**200, figure 1; column 3, lines 22-23; note that a laser printer is disclosed**), an I/O device to communicate the interim data (**column 3, lines 23-26; note that the main processor professes sequential printing commands supplied form the host computer to generate a bit-map type image data**), a pulse code generator (**600, figure 3; column 3, lines 26-28; note that the pulse generating circuit is disclosed**), to receive the interim data, for each multi-bit value, and to generate a pulse code corresponding to the multi-bit value (**column 3, lines 41-50; note that the pulse generator receives the image data and generates the address data for the pixels**), and a print engine (**700, figure 1**), to receive the pulse codes and to transform the pulse codes to a hardcopy image (**column 3, lines 56-60; note that after the pulse generator generates the pulse codes, it is transmitted to the print engine to be outputted**).

Gibson and Hattori are combinable because they are from the same field of endeavor i.e. processing data for outputting device. At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to a printing system comprising: a printing device including, an I/O device to communicate the interim data, a pulse code generator, to receive the interim data, for each multi-bit value, and to generate a pulse code corresponding to the multi-bit value, and a print engine, to receive the pulse codes and to transform the pulse codes to a hardcopy image. The suggestion/motivation for doing so would have been to enhance the resolution of an image so that the number of the gray scale levels, which can be expressed, is reduced in inverse proportion to the resolution of the image required to be printed (column 1, lines 14-22). Therefore, it would have been obvious to combine Gibson and Hattori to obtain the invention as specified in claim 1.

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching *including print engine control information for the pixel or the group of pixels to effect print quality enhancements.*

However, Roylance discloses *print engine control information for the pixel or the group of pixels to effect print quality enhancements* (**paragraph [0042], lines 6-13; note that the resolution enhancement procedure 122 of figure 1 takes control of the enhancement mode selection before the raster image is sent to the laser print engine i.e. the raster image also contains control information**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to the print engine control information for the pixel or the group of pixels to effect print quality enhancements. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 1.

(2) regarding claim 2:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein each multi-bit value comprises print parameters.

However, Roylance discloses wherein each multi-bit value comprises print parameters (**paragraph [0042], lines 13-20; note that the raster data is selectively processed by the halftone image enhancement procedure under the control of the enhancement mode selection circuitry 212 of figure 2**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein each multi-bit value comprises print parameters. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori Marshall et al. with Roylance to obtain the invention as specified in claim 2.

(3) regarding claim 3:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off.

However, Roylance discloses wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off (**paragraph [0042], lines 20-26; note that the toner conservation procedure can reduce toner usage i.e. considered as toner miser mode**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 3.

(4) regarding claim 4:

Gibson further discloses, a method for rendering a hardcopy image comprising:

on a host machine (**401, figure 4**),

generating page data at a selected bit rate per plane per pixel (**column 4, line 65-column 5, lines 2; note that a single bit per pixel raster data structure called plane which specifies the pixels of the multiple bit per pixel gets generated**), examining pixel data for a pixel or a group of pixels in the page data, either individually or in relation to neighboring pixels (**column 5, line 64-column 6, line 2; note that the stored color image as multiple bit per pixel raster data gets encoded in a multiple bit color value**);

based on the pixel data, rendering data to interim multi-bit values per plane per pixel interim value (**column 6, lines 5-8; note that the image data has already been rasterized and is ready to be transferred to the outputting device**), and

transferring the interim multi-bit values (**column 6, lines 31-34; note that the interim or each plane that has bit per pixel gets transmitted to the display device**); and

Gibson disclose all of the subject matter as described as above except for specifically teaching a printing device, transferring the interim multi-bit values to and from the host machine, generating pulse codes from the interim multi-bit values, and rendering a hardcopy image from the pulse codes.

However, as shown in figure 1, Hattori discloses a printing device (**200, figure 1; column 3, lines 22-23; note that a laser printer is disclosed**), transferring the interim multi-bit values to and from the host machine (**column 3, lines 23-26; note that the main processor professes sequential printing commands supplied form the host computer to generate a bit-map type image data**), generating pulse codes from the interim multi-bit values (**column 3, lines 41-50; note that the pulse generator receives the image data and generates the address data for the pixels**), and rendering a hardcopy image from the pulse codes (**column 3, lines 56-60; note that after the pulse generator generates the pulse codes, it is transmitted to the print engine to be outputted**).

Gibson and Hattori are combinable because they are from the same field of endeavor i.e. processing data for outputting device. At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to have a printing device, transferring the interim multi-bit values to and from the host machine, generating pulse codes from the interim multi-bit values, and rendering a hardcopy image from the pulse codes. The suggestion/motivation for doing so would have been to enhance the resolution of an image so that the number of the gray scale levels, which can be expressed, is reduced in inverse proportion to the resolution of the image required to be printed (column 1, lines 14-22). Therefore, it would have been obvious to combine Gibson and Hattori to obtain the invention as specified in claim 4.

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching *including print engine control information* *for the pixel or the group of pixels to effect print quality enhancements when rendering a hardcopy image.*

However, Roylance discloses *print engine control information for the pixel or the group of pixels to effect print quality enhancements when rendering a hardcopy image* (**paragraph [0042], lines 6-13; note that the resolution enhancement procedure 122 of figure 1 takes control of the enhancement mode selection before the raster image is sent to the laser print engine i.e. the raster image also contains control information**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to the print engine control information for the pixel or the group of pixels to effect print quality enhancements when rendering a hardcopy image. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 4.

(5) regarding claim 5:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein each multi-bit value comprises print parameters.

However, Roylance discloses wherein each multi-bit value comprises print parameters (**paragraph [0042], lines 13-20; note that the raster data is selectively processed by the halftone image enhancement procedure under the control of the enhancement mode selection circuitry 212 of figure 2**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein each multi-bit value comprises print parameters. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 5.

(6) regarding claim 6:

Gibson, Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off.

However, Roylance discloses wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off (**paragraph [0042], lines 20-26; note that the toner conservation procedure can reduce toner usage i.e. considered as toner miser mode**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 6.

(7) regarding claim 10:

As shown in figure 4, Gibson discloses a host machine including (**401, figure 4**), comprising:

means for generating page data at a predetermined bit rate per plane per pixel (**column 4, line 65-column 5, lines 2; note that a single bit per pixel**

raster data structure called plane which specifies the pixels of the multiple bit per pixel gets generated),

processor means (**402, figure 4**) for receiving the page data and for rending interim data based on image data contained in a pixel or a group of pixels in the page data (**column 5, line 64-column 6, line 2; note that the stored color image as multiple bit per pixel raster data gets encoded in a multiple bit color value**), and

an I/O device to communicate the interim data (**column 6, lines 31-34; note that the interim or each plane that has bit per pixel gets transmitted to the display device**); and

Gibson disclose all of the subject matter as described as above except for specifically teaching a printing system comprising: a printing device including, an I/O device to communicate the interim data, a pulse code generator, to receive the interim data, for each multi-bit value, and to generate a pulse code corresponding to the multi-bit value, and a print engine, to receive the pulse codes and to transform the pulse codes to a hardcopy image.

However, as shown in figure 1, Hattori discloses a printing system (**100, 200, figure 1**) comprising: a printing device including (**200, figure 1; column 3, lines 22-23; note that a laser printer is disclosed**), an I/O device to communicate the interim data (**column 3, lines 23-26; note that the main processor professes sequential printing commands supplied form the host computer to generate a bit-map type image data**), a pulse code generator (**600, figure 3; column 3, lines 26-28; note that the pulse generating circuit**

is disclosed), to receive the interim data, for each multi-bit value, and to generate a pulse code corresponding to the multi-bit value (**column 3, lines 41-50; note that the pulse generator receives the image data and generates the address data for the pixels**), and a print engine (**700, figure 1**), to receive the pulse codes and to transform the pulse codes to a hardcopy image (**column 3, lines 56-60; note that after the pulse generator generates the pulse codes, it is transmitted to the print engine to be outputted**).

Gibson and Hattori are combinable because they are from the same field of endeavor i.e. processing data for outputting device. At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to a printing system comprising: a printing device including, an I/O device to communicate the interim data, a pulse code generator, to receive the interim data, for each multi-bit value, and to generate a pulse code corresponding to the multi-bit value, and a print engine, to receive the pulse codes and to transform the pulse codes to a hardcopy image. The suggestion/motivation for doing so would have been to enhance the resolution of an image so that the number of the gray scale levels, which can be expressed, is reduced in inverse proportion to the resolution of the image required to be printed (column 1, lines 14-22). Therefore, it would have been obvious to combine Gibson and Hattori to obtain the invention as specified in claim 10.

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching the interim data containing a multi-bit per plane per pixel and print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image.*

However, Roylance discloses the interim data containing a multi-bit per plane per pixel and print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image* (**paragraph [0042], lines 6-13; note that the resolution enhancement procedure 122 of figure 1 takes control of the enhancement mode selection before the raster image is sent to the laser print engine i.e. the raster image also contains control information**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to have the interim data containing a multi-bit per plane per pixel and print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image*. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 10.

(8) regarding claim 11:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein each multi-bit value comprises print parameters.

However, Roylance discloses wherein each multi-bit value comprises print parameters (**paragraph [0042], lines 13-20; note that the raster data is selectively processed by the halftone image enhancement procedure under the control of the enhancement mode selection circuitry 212 of figure 2**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein each multi-bit value comprises print parameters. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 11.

(9) regarding claim 12:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off.

However, Roylance discloses wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off (**paragraph [0042], lines 20-26; note that the toner conservation procedure can reduce toner usage i.e. considered as toner miser mode**).

Gibson and Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 12.

(10) regarding claim 13:

Gibson further discloses, a method for rendering a hardcopy image (), the method comprising:

generating page data at a selected bit rate per plane per pixel () on data contained in a pixel or a group of pixels (**column 4, line 65-column 5, lines 2; note that a single bit per pixel raster data structure called plane which specifies the pixels of the multiple bit per pixel gets generated**),

rendering data to interim multi-bit values per plane per pixel (**column 6, lines 5-8; note that the image data has already been rasterized and is ready to be transferred to the outputting device**),

Gibson disclose all of the subject matter as described as above except for specifically teaching generating pulse codes directly from the interim multi-bit values, and rendering a hard copy image from the pulse codes.

However, as shown in figure 1, Hattori discloses generating pulse codes directly from the interim multi-bit values (**600, figure 3; column 3, lines 26-28; note that the pulse generating circuit is disclosed**), and rendering a hard copy image from the pulse codes (**column 3, lines 56-60; note that after the pulse generator generates the pulse codes, it is transmitted to the print engine to be outputted**).

Gibson and Hattori are combinable because they are from the same field of endeavor i.e. processing data for outputting device. At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to generating pulse codes directly from the interim multi-bit values, and rendering a hard copy image from the pulse codes. The suggestion/motivation for doing so would have been to enhance the resolution of an image so that the number of the gray scale levels, which can be expressed, is reduced in inverse proportion to the resolution of the image required to be printed (column 1, lines 14-22). Therefore, it would have been obvious to combine Gibson and Hattori to obtain the invention as specified in claim 13.

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching *including print engine control information for the pixel or the group of pixels to effect print quality enhancements.*

However, Roylance discloses *print engine control information for the pixel or the group of pixels to effect print quality enhancements* (**paragraph [0042], lines 6-13; note that the resolution enhancement procedure 122 of figure 1 takes control of the enhancement mode selection before the raster image is sent to the laser print engine i.e. the raster image also contains control information**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to the print engine control information for the pixel or the group of pixels to effect print quality enhancements. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 13.

(11) regarding claim 14:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein each multi-bit value comprises print parameters.

However, Roylance discloses wherein each multi-bit value comprises print parameters (**paragraph [0042], lines 13-20; note that the raster data is selectively processed by the halftone image enhancement procedure under the control of the enhancement mode selection circuitry 212 of figure 2**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein each multi-bit value comprises print parameters. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 14.

(12) regarding claim 15:

Gibson and Hattori disclose all of the subject matter as described as above except for specifically teaching, wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off.

However, Roylance discloses wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off (**paragraph [0042], lines 20-26; note that the toner conservation procedure can reduce toner usage i.e. considered as toner miser mode**).

Gibson, Hattori and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson and Hattori with Roylance to obtain the invention as specified in claim 15.

4. Claims 7-9 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Gibson (US Patent Number 5,828,361) in view of Roylance (US Publication Number 2002/0067509 A1).

(1) regarding claim 7:

As shown in figure 4, Gibson discloses a host machine including (**401, figure 4**), comprising

an application to generate page data at a predetermined bit rate per plane per pixel (**column 4, line 65-column 5, lines 2; note that a single bit per pixel raster data structure called plane which specifies the pixels of the multiple bit per pixel gets generated**),

an image processor to receive page data (**402, figure 4**), to examine pixel data for a pixel or a group of pixels in the page data, either for individual pixels or in relation to neighboring pixels (**column 5, line 64-column 6, line 2; note that the stored color image as multiple bit per pixel raster data gets encoded in a multiple bit color value**), and to render interim data that contains a multi-bit value per plane per pixel (**column 6, lines 5-8; note that the image data has already been rasterized and is ready to be transferred to the outputting device**), and

an I/O device to communicate the interim data (**column 6, lines 31-34; note that the interim or each plane that has bit per pixel gets transmitted to the display device**).

Gibson disclose all of the subject matter as described as above except for specifically teaching wherein the interim data including print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image based on the page data.*

However, Roylance discloses wherein the interim data including print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image based on the page data* (**paragraph [0042], lines 6-13; note that the resolution enhancement procedure 122 of figure 1 takes control of the enhancement mode selection before the raster image is sent to the laser print engine i.e. the raster image also contains control information**).

Gibson and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to wherein the interim data including print engine control information for the pixel or the group of pixels to effect print quality enhancements when rendering a hardcopy image based on the page data. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson with Roylance to obtain the invention as specified in claim 7.

(2) regarding claim 8:

Gibson disclose all of the subject matter as described as above except for specifically teaching, wherein each multi-bit value comprises print parameters.

However, Roylance discloses wherein each multi-bit value comprises print parameters (**paragraph [0042], lines 13-20; note that the raster data is selectively processed by the halftone image enhancement procedure under the control of the enhancement mode selection circuitry 212 of figure 2**).

Gibson and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein each multi-bit value comprises print parameters. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson with Roylance to obtain the invention as specified in claim 8.

(3) regarding claim 9:

Gibson disclose all of the subject matter as described as above except for specifically teaching, wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off.

However, Roylance discloses wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off (**paragraph [0042], lines 20-26; note that the toner conservation procedure can reduce toner usage i.e. considered as toner miser mode**).

Gibson and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art wherein the print parameters are selected from a group that includes toner miser mode, toner explosion, and edge roll off. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson with Roylance to obtain the invention as specified in claim 9.

(4) regarding claim 16:

As shown in figure 4, Gibson discloses a host machine including (**401, figure 4**), comprising means for generating page data at a predetermined bit rate per plane per pixel based on data contained in a pixel or a group of pixels (**column 4, line 65-column 5, lines 2; note that a single bit per pixel raster data structure called plane which specifies the pixels of the multiple bit per pixel gets generated**),

means for receiving the page data and rendering interim data that contains a multi-bit value per plane per pixel (**column 5, line 64-column 6, line 2; note that the stored color image as multiple bit per pixel raster data gets encoded in a multiple bit color value**), and

means for communicating the interim data (**column 6, lines 31-34; note that the interim or each plane that has bit per pixel gets transmitted to the display device**).

Gibson disclose all of the subject matter as described as above except for specifically teaching wherein the interim data including print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image based on the page data.*

However, Roylance discloses wherein the interim data including print engine control information for the pixel or the group of pixels *to effect print quality enhancements when rendering a hardcopy image based on the page data* (**paragraph [0042], lines 6-13; note that the resolution enhancement procedure 122 of figure 1 takes control of the enhancement mode selection before the raster image is sent to the laser print engine i.e. the raster image also contains control information**).

Gibson and Roylance are combinable because they are from the same field of endeavor i.e. Multi-level image reproduction (e.g., gray level reproduction). At the time of the invention, it would have been obvious to a person of ordinary skilled in the art to wherein the interim data including print engine control information for the pixel or the group of pixels to effect print quality enhancements when rendering a hardcopy image based on the page data. The suggestion/motivation for doing so would have been in order to enhance image processing techniques including resolution enhancement for improving the quality of text and line art, halftone image enhancement for improving the quality of gray value or halftone images and toner conservation for reducing toner consumption (paragraph [0022], lines 3-9). Therefore, it would have been obvious to combine Gibson Roylance to obtain the invention as specified in claim 16.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Notredame et al. (US Patent Number 6,049,390) discloses compressed merging of raster images for high speed digital printing.

6. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Hilina Kassa whose telephone number is (571) 270-1676.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Moore could be reached at (571) 272- 7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see http://pari-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hilina S Kassa/
Examiner, Art Unit 2625
June 30, 2008

/Edward L. Coles/
Supervisory Patent Examiner, Art Unit 2625